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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,746	02/05/2002	Thomas G. Brown	2003722-0002	9207

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EXAMINER	
MACCHIAROLO, PETER J	

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/068,746	BROWN ET AL.	
	Examiner	Art Unit	
	Peter J Macchiarolo	2879	

-- The MAILING DATE of this communication appears on the c ver sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-25 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-25 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 0802.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of the claim for benefit of Title 35, United States Code, Section 120 of the United States provisional application 60/266,792.

Information Disclosure Statement

2. The information disclosure statement filed 08/12/2002 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the received copies of Berezin (1998) and Kato and Lamont (1977) are not legible. It has been placed in the application file, but the information has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the refractive index of the cladding region decreasing smoothly and monotonically, parabolically, linearly, and in a series of *n* steps as recited in claims 14-17, respectively, must be shown or the feature(s) canceled from the claim(s). Further, the silica optical waveguide wherein the concentration of ^{30}Si or ^{29}Si ^{18}O decreases as recited in claims 18 and 19, respectively, must be shown or the feature(s) canceled

from the claim(s). The Examiner appreciates these limitations are difficult to show, but asserts that graphical representations will help to clearly show these relations. No new matter should be entered. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

5. **Claim 1 is objected to because of the following informalities:**

6. The claim structure used by Applicant does not conform to standard U.S. practice, and is difficult to interpret. Specifically, the claims do not clearly contain a preamble, a transitional word, or a main body. The multiple occurrences of the word "comprising" further inhibit proper comprehension of the claim's structure. See MPEP §608.01(m). The Examiner recommends the following claim structure:

[Preamble] [transitional word]:

[limitation X];

[limitation Y]; and

[limitation Z].

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 3 recites the cladding consists of "natural abundance silica." This is unclear. The Examiner reads the cladding comprises silica.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-6, 9-12, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Plekahnov ("Isotope Engineering," *Physics - Uspekhi* 43(11): 1147-1154, 2000; "Plekahnov").

9. Regarding claims 1, 3-5, and 22, Plekahnov discloses in Figure 1, a silica optical waveguide comprising: a core region having a first refractive index profile by virtue of comprising a first mixture of isotopes of silicon and oxygen (^{30}Si ^{18}O); and a cladding region having a second refractive index profile by virtue of comprising a second mixture of isotopes of

silicon and oxygen (^{28}Si ^{16}O), wherein the first and second mixtures include different isotopic concentrations of silicon and oxygen.

10. Regarding claim 2, Plekahnov further shows in Figure 1, the refractive index throughout the core region is substantially uniform; the refractive index throughout the cladding region is substantially uniform; and the refractive index of the core region is greater than the refractive index of the cladding region.

11. Regarding claim 6, Plekahnov discloses the core is further doped with germania.[1]

12. Regarding claims 9-12, Plekahnov discloses all of the recited limitations of claim 1 (above). The Examiner notes that the preamble recites that the silica optical waveguide is used in a WDM system, a TDM system, a soliton system, and a Raman amp system. These are intended use type preambles, and are not afforded any patentable weight, since it merely recites the intended use of a silica optical waveguide. Where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone, the preamble is generally not accorded any patentable weight. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

[1] Plekahnov, p. 1148, section 2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. **Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plekahnov in view of Nakazawa (USPN 3853384; "Nakazawa").**

14. Regarding claims 6-8, Plekahnov is silent to the silica optical waveguide being further doped with erbium, ytterbium or a combination thereof.

15. However, Nakazawa teaches that an optical waveguide core, being doped with erbium, ytterbium, or germania, and a cladding being doped with fluorine helps control the refractive index while enabling an optical amplification waveguide.[2]

16. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the waveguide of Plekahnov with the dopants of Nakazawa, to allow for an improved optical amplification waveguide.

17. **Claims 13-15 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plekahnov in view of Pinnow (USPN 5206925; "Pinnow").**

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[2] Nakazawa, col. 10, ll. 26-40.

18. Regarding claims 13-15, Plekahnov discloses the refractive index throughout the core is substantially uniform, and the refractive index of the core region is greater than the highest refractive index of the cladding region.

19. Plekahnov is silent to the cladding having a non-uniform refractive index, and especially decreasing in a series of *n* (1-100) steps or paraboliclly.

20. However, as evidenced by Pinnow, these are well-known cladding/core configurations. Pinnow teaches that "[the] cladding may be a single layer of substantially uniform index or two or more layers with each successive layer being of lower index than that underlying so as to approximate a parabolic gradient," and this configuration lowers insertion loss. [3]

21. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct Plekahnov's waveguide, including the index of refraction of the cladding being non-uniform, specifically, smoothly, monotonically, and parabolically decreasing with increasing distance from the boundary of the core region and the cladding region to lower insertion loss, and further since these are well-known configurations.

22. Regarding claims 18-21, Plekahnov is silent to the concentration of ^{30}Si, ^{29}Si, ^{18}O, germania, or fluorine decreasing from the boundary of the core region and the cladding region to the outer edge of the cladding region.

23. However, these are obvious configurations to decrease the index of refraction to form a gradient, as taught by Pinnow, above.

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[3] Pinnow, col. 3, ll. 58-68.

24. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the waveguide of Plekahnov including decreasing a concentration of ^{30}Si, ^{29}Si, ^{18}O, germania, or fluorine in the cladding region as recited in claims 18-21, to allow for allow for a refractive index cladding gradient to lower insertion loss.

25. **Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plekahnov in view of Pinnow, in further view of Tanaka et al (USPN 4893896; "Tanaka").**

26. Regarding claims 16, Plekahnov and Pinnow are silent to the refractive index of the cladding region decreasing linearly with increasing distance from the boundary of the core region and the cladding region.

27. However, as evidenced by Tanaka this is a well-known cladding/core configuration. Tanaka teaches that the "transmission loss is not increased even after the transmission of high-energy beams for a long time."[4]

28. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct Plekahnov's waveguide, including a linear cladding gradient, since this is a well-known configuration and improves transmission loss.

29. **Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plekahnov.**

[4] Tanaka, abstract.

30. Regarding claim 23, Plekahnov is silent to the at least one element comprises gallium, arsenic, or a combination thereof.

31. However, Plekahnov does disclose that GaAs isotopes are useful for inhibiting diffusion in isotope heterostructures and motivates one skilled in the art to conduct experiments with GaAs isotopes.[5]

32. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct Plekahnov's waveguide, wherein the at least one element comprises Gallium, arsenic, or a combination thereof, since this configuration will allow for reduce diffusion, thereby realizing an electronic device having a long, useful operating lifetime.

33. Regarding claim 24, Plekahnov discloses the core is further doped with germania.[6]

34. **Claims 7 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plekahnov in view of Heitmann.**

35. Regarding claims 7 and 25, Plekahnov is silent to the cladding region being further doped with fluorine.

36. However, Heitmann teaches that this configuration changes the glass's infrared absorption, which also can lower costs of an overall optic transmission line, and improve transmission quality.[7]

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[5] Plekahnov, p. 1152, section 6.
[6] Plekahnov, p. 1148, section 2.
[7] Heitmann, col. 4, ll. 33-46.

37. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the device of Plekahnov with Heitmann's fluorine doped cladding to achieve the benefits taught by Heitmann.

Conclusion

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Macchiarolo whose telephone number is (571) 272-2375. The examiner can normally be reached on 8:30 - 5:00, M-F.

39. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on (571) 272-2475. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

40. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

pjm

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